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| 10/737,312 | 12/16/2003 | Glenn M. Amber | 15876-46037 | 5952 |

7590

09/15/2005

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| EXAMINER |
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HOFFBERG, ROBERT JOSEPH

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| ART UNIT | PAPER NUMBER |
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2835

DATE MAILED: 09/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

Office Action Summary

Application No.

10/737,312

Applicant(s)

AMBER ET AL.

Examiner

Robert J. Hoffberg

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12/16/03.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on _____ is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 7-12 are rejected under 35 U.S.C. 102(b) as being anticipated by McCullough et al. (US 6,014,315).

With respect to Claim 1, McCullough et al. teaches the claimed system for coupling a heat sink to an electrical device independently of a clamping member that is used to place a coupling force between one or more electrical devices and a substrate to which the one or more electrical devices are to be electrically connected, the system comprising: a clamping member (Fig. 2, #146) adapted to push the one or more electrical devices (Fig. 2, #118) against the substrate (Fig. 2, #112), to assist in electrical connection between the one or more electrical devices and the substrate, the clamping member defining a through-hole (Fig. 2, #142) leading to each electrical device; a heat-conducting member (Fig. 2, #140) in a through-hole of the clamping member and adapted to thermally contact (Fig. 2, #121) the electrical device to conduct heat into or out of the electrical device; and a heat sink (Fig. 2, #144) in thermal contact with the heat-conducting member.

With respect to Claim 7, McCullough et al. teaches the heat-conducting member (Fig. 2, #140) protrudes from the clamping member (Fig. 2, #146). Note in Fig. 5, for

example, the portion of the heat-conducting member (140) above the through-hole (142) of the clamping member.

With respect to Claim 8, McCullough et al. teaches that the heat sink (Fig. 2, #144) is located outside (see Fig. 1) of the clamping member (Fig. 2, #146).

With respect to Claim 9, McCullough et al. the heat sink (Fig. 1, #144) directly contacts (see Fig. 1) the heat-conducting member (Fig. 2, #140).

With respect to Claim 10, McCullough et al. teaches the heat-conducting member (Fig. 2, #120) and heat sink (Fig. 2, #140) are integral.

With respect to Claim 11, McCullough et al. teaches that the coupling system of claim 1 in which the clamping member (Fig. 2, #146) directly contacts the electrical device (Fig. 2, #118).

With respect to Claim 12, McCullough et al. teaches that coupling system of claim 11 in which the clamping member (Fig. 2, #146) directly contacts some but not all (see Fig. 3) of the electrical device upper surface (Fig. 2, #133).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 2-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over McCullough et al. (US 6,014,315) as applied above in view of Tata et al. (US 5,397,919).

With respect to Claim 2, McCullough et al. teaches that the coupling system of claim 1. McCullough et al. does not teach for the heat-conducting member comprises a post with an enlarged end that contacts the electrical device. Tata et al. teaches a heat-conducting member comprises a post with an enlarged end (Fig. 5, #42). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the post of McCullough et al. with that of Tata et al. for the purpose of using the enlarged end to prevent removal of heat-conducting member (Tata et al. Col. 2, lines 28-30) and to increase contact area for greater heat dissipation.

With respect to Claim 3, McCullough et al. teaches a threaded through-hole as means of retention instead of a shoulder as claimed. Tata et al. teaches that the through-hole in the clamping member in which the heat-conducting member is located defines a shoulder (Fig. 5, #46) between the heat sink and the electrical device, the shoulder defining a through-hole width that is less than width of the enlarged end of the post, to allow the post to move within the through-hole yet prevent the post from being withdrawn from the through-hole. It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the through-hole of McCullough

et al. with that of Tata et al. for the purpose adding the shoulder to the through-hole to retain the post in the through-hole as an alternate equivalent means of retention.

With respect to Claim 4, McCullough et al. as modified by Tata et al. teaches that the coupling system of claim 3. They do not teach a resilient member located within the clamping member through-hole in which the heat-conducting member is located. Tata et al. teaches that a resilient member (Fig. 5, #14" bows upward, Col. 4, line 21) located within the clamping member through-hole in which the heat-conducting member is located, for urging the heat-conducting member into thermal contact with the electrical device. It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the coupling system of McCullough et al. with that of Tata et al. by adding a resilient member for the purpose of to allow the clamping member to be flexible.

Claim 5, 6, 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over McCullough et al. (US 6,014,315) and Tata et al. (US 5,397,919) as applied above, and further in view of Dehaine (US 5,010,949).

With respect to Claim 5, McCullough et al. as modified by Tata et al. teaches that the coupling system of claim 4. They do not teach a resilient member comprises a coil spring located around the heat-conducting member. Dehaine teaches the conventionality of using a coil spring (Fig. 1, #16) around a member (Fig. 1 #15) in order to urge a device in a clamping arrangement. It would have been obvious to one of ordinary skill in the art at the time of the invention was made for the resilient member of McCullough et al. as modified by Tata et al. to use a coil spring as an alternate or

additional resilient means urging for the purpose of having intimate contact with the electrical device without causing undue loading.

With respect to Claim 6, McCullough et al. as modified by Tata et al. teaches that the coupling system of claim 4. They do not teach that one end of the resilient member contacts the heat-conducting member and the other end contacts the clamping member such that the resilient member is compressed when the clamping member is moved toward the substrate. Dehaine teaches that one end of the resilient member contacts the heat-conducting member (lower portion of spring in Fig. 2) and the other end contacts the clamping member (upper portion of spring in Fig. 2) such that the resilient member is compressed when the clamping member is moved toward the substrate. It would have been obvious to one of ordinary skill in the art at the time of the invention for the resilient member of McCullough et al. as modified by Tata et al. to use a resilient member as taught by Dehaine to push the heat-conducting member towards the substrate accommodating misalignments or shifting of the heat sink when it contacts the chip.

With respect to Claim 13, McCullough et al. teaches a system for coupling a heat sink to an electrical device independently of a clamping member that is used to place a coupling force between one or more electrical devices and a substrate to which the one or more electrical devices are to be electrically connected, the system comprising: a clamping member (Fig. 2, #146) adapted to push the one or more electrical devices (Fig. 2, #118) against the substrate (Fig. 2, #112), to assist in electrical connection between the one or more electrical devices and the substrate, the clamping member

defining a through-hole (Fig. 2, #142) leading to each electrical device; a heat-conducting post (Fig. 2, #140) in a through-hole of the clamping member. McCullough et al. does not teach a heat-conducting post with an enlarged end adapted to thermally contact the electrical device to conduct heat into or out of the electrical device; a heat sink in thermal contact with the heat-conducting member; and a spring member in the through-hole in the clamping member adapted to be compressed between the clamping member and the enlarged end of the post, to assist in thermal contact between the enlarged end and the electrical device. Tata et al. teaches a heat-conducting post with an enlarged end (Fig. 5, #42) adapted to thermally contact the electrical device to conduct heat into or out of the electrical device (Fig. 5, #42). Tata et al further teaches that a resilient member (Fig. 5, #14" bows upward, Col. 4, line 21) located within the clamping member through-hole in which the heat-conducting member is located, for urging the heat-conducting member into thermal contact with the electrical device. Dehaine teaches the use of a spring member (Fig. 1, # 16) for clamping a heat-conducting member (Fig. 1, #15) in contact with the electrical device (Fig. 1, #14). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the clamping member and heat-conducting post of McCullough et al. with the enlarged end of Tata et al., to modify the coupling system of by adding a resilient member for the purpose of to allow the clamping member to be flexible. It further would have been obvious to employ a spring as used by Dehaine in the resilient clamping structure of McCullough et al. as modified by Tata et al. to provide additional urging of

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the heat conducting member in contact with the electrical device without causing undue loading.

With respect to Claim 14, McCullough et al. as modified by Tata et al. and further modified by Dehaine teaches that the coupling system of claim 13. They do not teach a coil spring located around a post. Dehaine further teaches a coil spring of located around a post. It would have been obvious to one of ordinary skill in the art at the time of the invention for a coil spring to be placed around the post of McCullough et al. as modified by Tata et al. and Dehaine in order to urge the device into a secure clamping relationship.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert J. Hoffberg whose telephone number is (571) 272-2761. The examiner can normally be reached on 8:30 AM - 4:30 PM Mon - Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynn D. Feild can be reached on (571) 272-2092. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

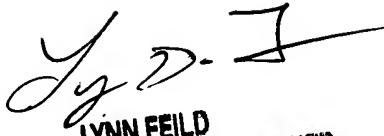
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SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800